A commentary on scientific integrity

I am compelled to write this commentary after reading the paper by Jade *et al.*[1]. Although the authors have been gracious enough to acknowledge us, I consider this paper a violation of scientific ethics. Let me briefly sketch the background. The data and the survey points used in their paper form part of a project that I conceived and commenced independently in 2001. Since we did not have any GPS receivers, we used to get them on loan from various organizations, and in 2003, we took them from C-MMACS, Bangalore. Sreedevi Jade (scientist at C-MMACS and the senior author of the paper in question) suggested that Souvik Banerjee who was working in C-MMACS as project assistant would accompany us to help handle their receivers and also to occupy two points at Port Blair (CARI campus) and Havelock (HAVE), previously established by C-MMACS. Banerjee, however, made it clear to me that his interest was mainly in locating and occupying the two points established previously by scientists from C-MMACS, other than being a field help to us. However, these survey points (known as CARI and HAVE) could not be located, as they were probably destroyed by construction activities. Nonetheless, we invited Banerjee to join us with our work and he joined us in setting up two stations, those at DGLP (Diglipur) and Chatham (CHAT). In addition, we had also shown him our station at Havelok, set up by us in 2002 (note that this is different from HAVE, the C-MMACS point, which was not traceable). During the same season, we set up additional stations at Car Nicobar and Campbell Bay, but Banerjee chose not to accompany us to these sites. After completing the work in that season, we returned the receivers and the data were downloaded to the computer at C-MMACS. Subsequently, Banerjee left C-MMACS, and Jade did not show any interest in this work (although I suggested a collaborative study, initially), nor did she evince any interest in future work in these sites. In fact, when I requested to loan the equipment in September 2004, Jade discouraged me from conducting the survey at that time and did not lend us the units. Since I thought it was important to continue the work, I borrowed them from elsewhere and continued our work. The 2004 earthquake suddenly kindled their interest and computing the coseismic displacement became an important issue. *At this time, the C-MMACS group went ahead and reoccupied our control points, clandestinely. They never communicated with us nor cared to request our permission, either about using the data collected in 2003 or about reoccupying the bases established and maintained by us. The basis of the paper in question are the data from 2003 and that collected after the earthquake, by reoccupying some of the stations, set up independently by my student and me.* None from C-MMACS (including Banerjee) ever visited Car Nicobar before the earthquake to set up any GPS control points that have now provided the crucial data; it was set up by my student and myself, spending a lot of time and money, in tough field conditions. However, *since the coordinates and data were available in C-MMACS, their personnel could trace all our stations and reoccupy them.*

Obviously, the paper presents an important dataset and the enthusiasm of the journal to publish it is understandable. However, I believe that scientific ethics demands that the authors should have taken our expressed consent to occupy the control points. This is my project – an experiment that had been designed by me with the realization of the potential of this zone to generate large earthquakes (stated clearly in the project proposal submitted by me in 2001 to Department of Science and Technology, Govt of India and in a paper published in *Current Science*, 2003, **84**, 919–924), and it constitutes a doctoral thesis of my student, who is on a learning curve as far as the GPS data processing is concerned. It is a fact known to the researchers in this field that we had processed the data from all our stations, and part of our preliminary results had already been put up in our website (www.seires.net) in the last week of January, itself. *I hold the view that Jade's unilateral use of someone else's data compounded by the fact that two of her assistants occupied the control points set up by us without our consent or even informing us is highly objectionable, and it should not have been encouraged.*

I have summed up the whole background here, which I hope will help the readers evaluate this case. In fact, I think, the underlying issue goes beyond one person stepping on another's toe, by design or accident (this appears to be a clear case of design, however); it is also about the basic rules in the practice of science. In this regard I like to alert the readers to a recent article in *Nature* on misconduct in research (Martinson *et al*., 2005, **435**). The article highlights a wide range of questionable research practices other than falsification, fabrication and plagiarism. The authors believe that *serious misbehaviour in research is important for many reasons, not least because it damages the reputation of, and undermines public support for science… we believe that researchers can no longer afford to ignore a wide range of questionable behaviour that threatens the integrity of science*. The authors of the *Nature* article think that more than the individuals, some aspects of the working environment, institutional and systemic structures may have the "detrimental effects on the ethical dimensions of scientists' work". I can only share the views of these authors and join in their plea to develop stronger mechanisms to improve the 'broader research environment' to ensure scientific integrity. Such transgressions of ethics must be viewed seriously by the organizations involved in research. The corrective measures should see that a set of ground rules is strictly followed and a level playing field maintained where might need not be right.

1. Jade, S. *et al.*, *Curr. Sci.*, 2005, **88**, 1980–1984.

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Response:

The commentary on our article repeats the very allegations which we had answered before *Current Science* decided to publish our paper. We assume that this was done, after ascertaining the facts *vis-à-vis* the various imagined accusations which to my understanding of the situation, have no factual basis. I hope, it would be appreciated that I do not wish to respond to the imagined arguments in the commentary

Table 1. Results of data analysed

Station	Code	CESS website 23.03.05 result (m)	Present CESS website result (m)	Discrepancy (m) between their estimates	C-MMACS result (m) in *Current Science*, 2005, **88**, 1980–84
Diglipur	DGLP	3.33	4.81	1.48	4.78
Port Blair	PBLR	2.21	3.08	0.87	
Hutbay	HBAY	3.9	4.53	0.63	
Car Nicobar	CARN	5.63	6.28	0.65	6.49
Campbell bay	CBAY	3.5	4.63	1.13	

which accuses us of clandestine operations and similar wild accusations. However, in the interest of transparency, I hereunder reiterate the following checkable facts which can be ascertained from various available records, whereof a copy can be obtained from the C-MMACS office, if desired.

1. A collaborative programme of GPS field work (letter dated 16 July 2003) in the Andaman and Nicobar Islands was implemented jointly by C-MMACS and CESS during August–September 2003 in pursuance of our respective objectives. Our objective was clear: to re-check our earlier published result of the velocity of Andaman Islands by new measurements, and set up additional control points for subsequent measurements after a year or two. This proposal was approved by Head, C-MMACS as a collaborative campaign (C-MMACS Office copy no CMM/R-0-133, dated 22.07.03).

2. That C-MMACS Research Fellow, Souvik Banerjee was deputed to carry out GPS measurements in the Andaman along with CESS scientists, on the old as well as new control points. Data generated on receivers taken from C-MMACS at five new sites jointly set up for this collaborative project, were analysed by us and a report (PD CM 0307) was issued in November 2003, and the data collected was archived at both C-MMACS and CESS. At no stage in all these activities, was it pointed out to us that the work was not collaborative or had ceased to be collaborative. Given this, it was our understanding that these data were collected jointly on a collaborative effort and both the institutions had the right to use the data.

3. After the occurrence of the Sumatra earthquake, C-MMACS wanted to re-measure the five previously setup control points in the Andaman in collaboration with CESS and establish additional control points for detailing the post-earthquake strain field in the region. However, we learnt that CESS scientists were already in the Andaman re-measuring the sites, this time using NGRI receivers, without even informing us (no communication from CESS after 15 September 2003) that they were pulling out of the CESS–C-MMACS collaboration. Although we were hurt by this behaviour, we went ahead and made measurements on our own as we had spent considerable time, money and effort during the 2003 campaign with CESS, and so we could not abandon our active programme in the Andaman since 1996.

4. The new data collected by C-MMACS at four of the sites jointly set up with CESS in 2003, and 11 additional sites were then reanalysed by us. Remeasured data at the four sites were analysed in conjunction with those in the 2003 report, to determine the co-seismic displacements caused by the intervening 26 December event, using our earlier interseismic velocities reported by Paul *et al.*[1]. This paper was submitted for publication to *Current Science* on 24 March 2005. A preprint version has been cited (R. Bilham, *Science* as the most important result of earthquake confirming northern slip).

5. Meanwhile, CESS scientists analysed the data of their 2005 campaign and of the joint 2003 campaign, and posted it on their website (refer Table 1) dated 23 March 2005 (http://www.seires.net/content/view/123/52). R. Bilham of Colorado State University had also informed us that noting the wide discrepancy (refer Table 1) between our results of the co-seismic displacements and those of CESS on their web (from 0.6 to 1.5 m), he advised them to recheck the analysis of their data. Subsequently, it was found that CESS website had revised their results stating co-seismic values closer to ours, but without any acknowledgement of the origin of this revision.

6. The origin of this correction on their publically displayed website remains unacknowledged to this day, raising ethical questions.

7. Finally, irrespective of the validity of such intemperate accusations, imagine the magnitude of scandal that might have been created by an Indian scientific group, amongst the world scientific community, because of a patently inaccurate analysis of an important co-seismic earth parameter, if our results had not been available for alerting them through the review process of *Current Science*. Our *Current Science* paper, if not anything else, provided a cross-check on the coseismic deformation related to the Sumatra earthquake. It had prevented wrong numbers from going into the scientific literature by prompting reassessment of the results.

1. Paul, J. *et al*., *Geophys. Res. Lett*., 2001, **28**, 647–650.

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